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REC'D 11 OCT 2006

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference K 50 110/10mz	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2004/003252	International filing date (day/month/year) 26.03.2004	Priority date (day/month/year) 26.03.2004
International Patent Classification (IPC) or both national classification and IPC INV. C08L23/06		
Applicant BOREALIS TECHNOLOGY OY		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
 - II ☒ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☒ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☒ Certain observations on the international application

Date of submission of the demand 04.01.2006	Date of completion of this report 10.10.2006
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Schmidt, Helmut Telephone No. +31 70 340-2461 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP2004/003252

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-22 as originally filed

Claims, Numbers

1-10 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP2004/003252

II. Priority

1. ☒ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
- ☒ copy of the earlier application whose priority has been claimed.
- ☐ translation of the earlier application whose priority has been claimed.
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid.

Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-10
Inventive step (IS)	Yes: Claims	
	No: Claims	1-10
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations

see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and /or

2. Non-written disclosures (Rule 70.9)

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Box I

1. The following documents are referred to in the present opinion; the numbering will be adhered to the entire procedure

D1 WO-A-02/34829
D2 EP-A-1359192
D3 WO-A-02/102891
D4 EP-A-1359191
D5 EP-A-1460105

Box V

2. Present claims 1-10 do not appear to be novel in the sense of Art. 33(2) PCT

2.1 Subject matter of claim 1 is a bimodal polyethylene resin for pipes of MI_5 0.1-0.22 g/10 min, $d > .952$ g/cm³ of

- (A) 45-55% low molecular weight polyethylene
- (B) 55-45% high molecular weight polyethylene

2.2 The subject matter of claim 1 is disclosed in

D1, comparative example 19

D2, example 6

D3, example 9R in combination with page 4, line 8-12

2.3 D4, example 5, discloses a blend of 54% of low molecular weight polyethylene, $d = .9735$ g/cm³, $MI_2 = 359.1$ and 48% high molecular weight polyethylene, $d = .9242$ g/cm³. The resulting blend has a $MI_5 = 0.25$ g/10 and $d = .9534$ g/cm³.

Example 5 of D4 is regarded as novelty destroying for present claim 1 even though the resulting blend has not the same melt index MI_5 as claimed in present claim 1.

MI_5 and density of the resulting blend are not only dependant on the bimodal polymer, but in a composition comprising a polymer, they can be adjusted by other, non-essential components like fillers (see D5, table 2 and 3). Clear essential technical features of the present bimodal blend is only the ratio of the two fractions, i.e. 45:55-55:45. This feature is disclosed by D4, i.e. D4 is novelty destroying for the present claim (Art 33(2) PCT). If the applicant is of the opinion, that D4 differs from the present claim,

the claim is apparently lacking other essential technical features. Consequently it is unclear (Art. 6 PCT) and insufficiently disclosing the invention (Art 5 PCT). From only the disclosure of the ratio of two polymers, it seems to be impossible for a skilled man to solve the technical problem, i.e. reduced sagging, even if other parameters of the resulting resin blend are disclosed, since he does not know which properties the resin fractions have to have to obtain the resulting resin blend .

2.4 The subject matter of claims 2-10 is disclosed in D1-D4 and hence not novel

3. The present claims 1-10 do not appear to be inventive in the sense of Art. 33(3) PCT

If example 5 of document D4 would be regarded as closest prior art, the only distinguishing feature is MI_5 . The problem resulting from the choice of MI_5 is the reduction of sagging. However, the solution, to choose a polymer of reduced melt index, is obvious to a skilled man: it is general knowledge for the skilled man that a polymer with lower melt index will have less sag (as can be seen from the method of measurement of the melt index)

Box VI

4. Table 2 of D5, which was published after the priority date of the present application on 22.9.2004, discloses the bimodal polyethylene resin of present claims 1-10

Box VIII

5. Claims 1, 4, 5 and 8 are unclear in the sense of Art. 6 PCT

5.1 The terms "low" and "high" in claim 1 are unclear. They are insufficient to distinguish the two molecular weight fractions from each other

5.2 The standard of measurement of the melt index in claims 1 and 8, the dynamic viscosity in claim 4 and the shear thinning in claim 5 are not disclosed in the claims